

AMENDMENTS TO THE CLAIMS

Please amend claims 1, 2, 19, 20, 21, 22, 23 and 24, and cancel claims 4 and 5, as set out below.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An optical device which is an optical attenuator or an optical modulator, the optical device comprising:

- (a) a waveguide layer that includes a waveguide comprised of a second-order nonlinear optical polymer and at least a first and second grating;
- (b) [[a]] means for communicating a negative electric field to said first grating; and
- (c) [[a]] means for communicating a positive electric field to said second grating.

Claim 2 (currently amended): An optical device which is an optical attenuator or an optical modulator, the optical device comprising:

- (a) a waveguide layer that includes a waveguide comprised of a second-order nonlinear optical polymer and at least a first and second grating;
- (b) a first electrode positioned so as to communicate a negative electric field to said first grating upon application of a negative voltage to said first electrode; and
- (c) a second electrode positioned so as to communicate a positive electric field to said second grating upon application of a positive voltage to said second electrode.

Claim 3 (original): The optical device according to claim 2, wherein said device further comprises one or more cladding layers.

Claim 4 (original): The optical device according to claim 2, wherein said device further comprises a substrate layer.

Claims 5-6 (canceled).

Claim 7 (original): The optical device according to claim 2, wherein one of said gratings is tunable.

Claim 8 (original): The optical device according to claim 2, wherein both of said gratings are tunable.

Claim 9 (original): The optical device according to claim 2, wherein one of said gratings is comprised of an optical nonlinear second-order polymer.

Claim 10 (original): The optical device according to claim 2, wherein both of said gratings are comprised of an optical nonlinear second-order polymer.

Claim 11 (original): The optical device according to claim 2, wherein at least one of said gratings is comprised of an optical nonlinear second-order polymer that is the same as said polymer that comprises said waveguide.

Claim 12 (original): The optical device according to claim 2, wherein at least one of said gratings is comprised of an optical nonlinear second-order polymer that is different than said polymer that comprises said waveguide.

Claim 13 (original): The optical device according to claim 2, which further comprises a ground.

Claim 14 (original): The optical device according to claim 2, wherein said optical nonlinear second-order polymer is selected from the group consisting of modified polyimide-hydroxy-diazo-sulfone, polyimide-amine-azo-nitro and polyimide-amine-diazo-dinitro.

Claim 15 (original): The optical device according to claim 2, wherein said optical nonlinear second-order polymer has the structure

wherein Z is a polymer backbone, S is a spacer attached to Z, and C is an azo or stilbene chromophore.

Claim 16 (original): The optical device according to claim 15, wherein Z is where n ranges from about 20 to about 600.

Claim 17 (original): The optical device according to claim 15, wherein S is a carbon chain comprising from 0 to 30 atoms.

Claim 18 (original): The optical device according to claim 15, wherein C is dialkyl-amino-sulfone-stilbene.

Claim 19 (currently amended): An optical device which is an optical attenuator or an optical modulator, the optical device comprising:

- (a) a waveguide layer that includes a waveguide comprised of a second-order nonlinear optical polymer and a first and second grating;
- (b) a first electrode positioned so as to communicate a negative electric field to said first grating upon application of a negative voltage to said first electrode;
- (c) a second electrode positioned so as to communicate a positive electric field to said second grating upon application of a positive second voltage to said second electrode;
- (d) a substrate layer;
- (e) a first cladding layer positioned between said first and second electrodes and said waveguide layer; and
- (f) a second cladding layer positioned between said waveguide layer and said substrate layer.

Claim 20 (currently amended): An optical device which is an optical attenuator or an optical modulator, the optical device comprising:

- (a) a waveguide layer that includes a waveguide comprised of a second-order nonlinear optical polymer and at least one grating;
- (b) a means for communicating a negative electric field to one end of said grating; and
- (c) a means for communicating a positive electric field to the other end of said grating.

Claim 21 (currently amended): An optical device which is an optical attenuator or an optical modulator, the optical device comprising:

- (a) a waveguide layer that includes a waveguide comprised of a second-order nonlinear optical polymer and at least one grating;
- (b) a first electrode positioned so as to communicate a negative electric field to one end of said grating upon application of a negative voltage to said first electrode; and
- (c) a second electrode positioned so as to communicate a positive electric field to the other end of said grating upon application of a positive voltage to said second electrode.

Claim 22 (currently amended): An optical device which is an optical attenuator or an optical modulator, the optical device comprising:

- (a) a waveguide layer that includes a waveguide comprised of a second-order nonlinear optical polymer and at least one grating;
- (b) a first electrode positioned so as to communicate a negative electric field to one end of said grating upon application of a negative voltage to said first electrode;
- (c) a second electrode positioned so as to communicate a positive electric field to the other end of said grating upon application of a positive second voltage to said second electrode;
- (d) a substrate layer;
- (e) a first cladding layer positioned between said first and second electrodes and said waveguide layer; and
- (f) a second cladding layer positioned between said waveguide layer and said substrate layer.

Claim 23 (currently amended): A method for modulating ~~or amplifying~~ light traveling along a waveguide comprising the steps of:

- (a) applying an optical signal to a waveguide that is comprised of a second-order nonlinear optical polymer and contains a first and second grating;
- (b) applying a negative voltage to a first electrode positioned so as to communicate a negative electric field to said first grating; and
- (c) applying a positive voltage to a second electrode positioned so as to communicate a positive electric field to said second grating.

Claim 24 (currently amended): A method for modulating ~~or amplifying~~ light traveling along a waveguide comprising the steps of:

- (a) applying an optical signal to a waveguide that is comprised of a second-order nonlinear optical polymer and at least one grating;
- (b) applying a negative voltage to a first electrode positioned so as to communicate a negative electric field to one end of said grating; and
- (c) applying a positive voltage to a second electrode positioned so as to communicate a positive electric field to the other end of said grating.